SOV/56-36-2-53/63

21(7)

AUTHORS: Bogdanov, G. F., Vlasov, N. A., Kalinin, S. P., Rybakov, B.V., Samoylov, L. N., Sidorov, V. A.

TITLE: The Reaction $T(p,n)He^3$ at Proton Energies of 7 to12 Mev (Reaktsiya $T(p,n)He^3$ pri energii protonov 7 - 12 MeV)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 2, pp 633-636 (USSR)

ABSTRACT: The present paper deals with the measurement of the cross sections and of the angular distributions of the reaction T(p,n) in the interval 7 - 12 Mev of proton energies. Moreover, the authors tried to measure the polarization of the neutrons in this reaction. A solid tritium-zirconium target (thickness 20 μ) was bombarded by protons accelerated to 12 Mev in a cyclotron. The neutron flux was measured by a telescope consisting of 4 proportional counters and also by a spectrometer. The cross sections are measured with a precision of 10%. The first diagram shows the results of the measurement of the cross section under the angle 0° and previously published results of the measurements in the energy interval of 1 - 7 Mev. The cross section is approximately constant in the investigated energy interval, and it increases

Card 1/3

slightly at energies of 11 - 12 Mev. The second diagram gives the angular distributions of the neutrons at the energies 8.8; 8.9; and 12 Mev. The high forward-backward anisotropy indicates an intense interference of the states of different parity. The curves given in the figures correspond to expressions of the type $\sigma(\theta) = A + B\cos\theta + C\cos^2\theta + D\cos^3\theta + E\cos^4\theta$ in the c.m.s.. The coefficients of these expressions were calculated by the method of least squares and they are given in the following table:

E_p (Mev)	A	B	C	D	E	σ_t (mb)
6.8	11.1	11.3	24.4	-51.4	25.3	305
8.9	13.3	1.0	1.3	-28.4	27.3	241
12.0	13.0	7.5	-23.7	-24.9	44.6	176

The third diagram shows the energy dependence of the reaction. The investigation of the polarization of the neutrons produced in the reaction $T(p,n)He^3$ is important for the determination of the characteristics of the excited states of an α-particle. The inverse reaction $He^3(n,p)T$ was investigated according to a method suggested by H. H. Barshall. According to this method, the absolute values of the polarization can be measured without an analyzer of known polarization properties. According to the measurements discussed in the present paper, for $E_p \lesssim 10$ Mev and for the angles satisfying Barshall's condition asymmetry is not higher than 5%. A noticeable asymmetry was observed in the case $\theta_1 = \theta_2 = 40^0$, and this asymmetry indicates a polarization of the neutrons. θ_1 denotes the angle under which the chamber filled with He^3 (10 atmospheres) was placed in the neutron beam. By means of a telescope of proportional counters, the right-left asymmetry of the flying off of protons from the reaction $He^3(n,p)T$ under the angle θ_2 was measured. There are 3 figures, 1 table, and 9 references, 6 of which are Soviet.

SUBMITTED: November 17, 1958

21(7)

AUTHORS: Vlasov, N. A., Ogloblin, A. A. SOV/56-37-1-9/64

TITLE: The (d,t)-Reaction on Li^6-, Li^7-, and Be^9 Nuclei (Reaktsiya (d,t) na yadrakh Li^6-, Li^7- i Be^9)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 1, pp 54-61 (USSR)

ABSTRACT: By means of a method worked out by the authors in their laboratory the spectra of tritons emitted at various angles between 7 and 150° in the (d,t) reaction were investigated for 20 Mev deuterons which had been accelerated in a cyclotron. Calculation of angular distribution was carried out by means of Butler's formula amended according to Newns (5); the triton form factor was obtained from a paper by French. Results: $Li^7(d,t)Li^6$: figure 1 shows the characteristic shape of the triton spectrum (in this case at 7°); the spectrum has 3 distinct maxima - the ground state and the two first excited states (2.19 and 3.58 Mev); the levels with 4.5 and 5.3 Mev are only very weakly developed. The continuous triton spectrum to be investigated is explained as being due to a breakup of the remaining excited nuclei: $Li^7(d,n)Be^{8*} \rightarrow Li^5 + t$ or

Card 1/3

$Li^7(d,d')Li^{7*} \rightarrow He^4 + t$. Figures 2 and 3 show the angular distribution of three groups of tritons, which agrees well with that calculated according to Butler. For small angles σ_{max} = 1.5 mb/steradian. $Li^6(d,t)Li^5$: Figure 4 shows the spectrum of tritons from this reaction (measured below 6.5°). Besides the two ground state maxima of Li^5 and Li^6, the spectrum has yet another weak maximum at 2.19 Mev (Li^6). The width of the Li^5 ground level was determined as amounting to (1.3±0.2) Mev. The continuous spectrum observed may be explained in different ways, as e.g. as the result of the reaction $Li^6(d,p)Li^{7*} \rightarrow He^4 + t$. The angular distribution of this reaction - if the Li^5 formed is in the ground state - is shown by figure 5; the curve was again calculated according to Butler. $Be^9(d,t)Be^8$: The spectrum has 2 distinct maxima, the narrow, high one of the Be^8-ground state, and the wide one (width 1.35±0.15 Mev), which is barely half as high, of the excited state with 2.9 Mev. Moreover, there is the possibility of the existence of peaks at 4.2, 4.9, 5.4, and 6 Mev; a small but distinctly marked maximum is at 16.9 Mev. Figure 7 shows the angular distribution $\sigma(\vartheta)$ for transition into the ground- and into the first excited state of Be^8. The continuous spectrum is ascribed to the reaction $Be^9(d,\alpha)Li^{7*} \longrightarrow He^4 + t$; σ_{tot} in this part of the spectrum is given as 50 mb. The total measuring data of all reactions investigated are given by a table. The absolute error in cross section measurement is given as amounting to ± 20 %. Generally spoken it may be said that the probability of the formation of excited states in the final nucleus decreases sharply with increasing excitation energy. The authors finally thank S. P. Kalinin for his interest in this investigation, and they also thank the cyclotron team under Yu. M. Pustovoyt for carrying out the irradiation, and finally also A. I. Baz' and D. P. Grechukhin for discussions. There are 8 figures, 1 table, and 13 references, 1 of which is Soviet.

SUBMITTED: February 27, 1959

VLASOV, N. A.

"Survey of Experimental Work"

report submitted for the 2nd USSR Conference on Nuclear Reactions at Low and Intermediate Energies, Moscow, 21-28 July 1960.

VLASOV, N.A.; KALININ, S.P.; RYBAKOV, B.V.; SIDOROV, V.A.

[Neutron spectrum of the d + p reaction] Spektry neitronov reaktsii d + p. Moskva, In-t atomnoi energii AN SSSR, 1960. 15 p. (MIRA 17:3)

S/089/60/009/005/006/020
B006/B070

24.6720

AUTHORS: Pankratov, V. M., Vlasov, N. A., Rybakov, B. V.

TITLE: Fission Cross Sections of Th^{232}, U^{235}, Np^{237}, and U^{238} for Neutrons Having Energies of 10-22 Mev

PERIODICAL: Atomnaya energiya, 1960, Vol. 9, No. 5, pp. 399 - 401

TEXT: Measurements of fission cross sections for high-energy neutrons are communicated in this "Letter to the Editor". The neutron source was the reaction $D(d,n)He^3$; the analysis was made by the time-of-flight method, as it avoided some of the difficulties discussed in the introduction. The deuteron energies were varied from 6.5 to 19.5 Mev (E_n: 9.7 - 21.7 Mev) by means of platinum foils. The energy spread of the neutron was between 250 and 700 kev. All measurements were made at an angle of 0° to the deuteron beam. The fission events were recorded by means of a gas scintillation fission chamber (xenon) and a photomultiplier of the type ФЭУ-33 (FEU-33). The pulses from the multiplier were fed into a multi-channel time-of-flight spectrometer. The results

Card 1/2

Fission Cross Sections of Th^{232}, U^{235}, Np^{237}, and U^{238} for Neutrons Having Energies of 10-22 Mev

S/089/60/009/005/006/020
B006/B070

of the study are shown in Fig.2. The statistical error was 3%, the relative error not more than ±5%. The broken parts of the curves correspond to the data from Ref.1 (Los Alamos). The behavior of the curves is briefly discussed. S. P. Kalinin is thanked for help in the solution of methodological problems; and N. I. Venikov and A. A. Kurashov for the smooth working of the apparatus. There are 2 figures and 5 references: 4 Soviet and 1 US.

SUBMITTED: July 21, 1960

Card 2/2

VLASOV, N.A.; KALININ, S.P.; OGLOBLIN, A.A.; CHUYEV, V.I.

(d, t)-Reaction on medium and heavy nuclei. Zhur. eksp. i teor. fiz. 38 no.1:280-282 Jan '60. (MIRA 14:9)
(Nuclear reactions) (Tritons (Tritium ions))

85681

Neutron Spectra of the d+p Reaction

S/056/60/038/006/023/049/XX
B006/B070

2.5 mμsec; the channel width of the time analyzer was about 0.8 mμsec. The recording device had 256 channels with a capacity of 2^{16} pulses per channel. For illustration, the distribution of the neutrons from H(d,n)2p is given (Fig. 1) as a function of their time of flight at an angle of 0° with the deuteron beam, E_d being 18.6 Mev. The target - counter distance was 2.8 mm, the counter threshold 3.2 Mev, and the time analyzer channel width 0.836 mμsec. Figs. 2 and 3 show the energy distribution of neutrons in the laboratory system of the two reactions studied. The path lengths in the first case were 7m (o) and 2.8m (o), and in the second case, 5.15 m (o) and 1.58 m (o). The neutron production cross sections at 0° for the reaction H(d,n)2p was (150±15)mb/steradian, and for the reaction D(p,n)2p (47±5) mb/steradian. In the center-of-mass system of the three nucleons, the cross sections were (20±2)mb/steradian and (11±1)mb/steradian, respectively, at 0° and 180° with the deuteron beam. Figs. 4 and 5 show the neutron spectra of the reactions d+p→2p+n at angles of 0 and 180°, respectively, with the deuteron beam, and for E_0=4.0 Mev and E_0=3.5 Mev, respectively. In addition to a peak on the edge, the spectrum at 180° shows a peak also at a neutron energy of

Card 2/5

85681

S/056/60/038/006/023/049/XX
B006/B070

Neutron Spectra of the d+p Reaction

0.6 Mev whose position corresponds to a zero relative velocity of the neutron and one of the protons in the final state. The results show that nucleon pairs of low kinetic energy of relative velocity have a large probability of formation in the reaction $d+p \rightarrow 2p+n$. Finally, the explanation of the spectra by pair interaction between nucleons in the final state is discussed and compared with the results of other authors. A. B. Migdal, V. V. Komarov, and A. M. Popova are mentioned. There are 5 figures and 10 references: 6 Soviet and 4 US.

SUBMITTED: February 15, 1960

Card 3/5

85681

S/056/60/038/006/023/049/XX
B006/B070

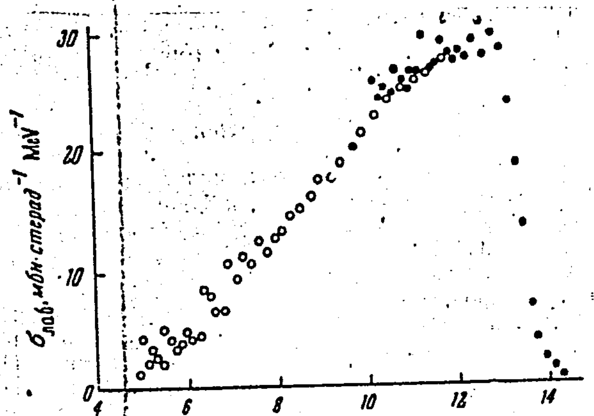


Fig. 2

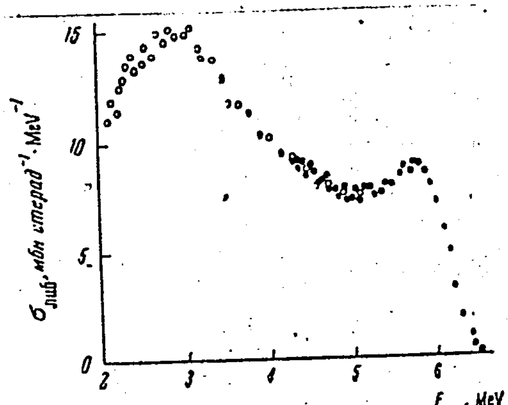


FIG. 3

Card 4/5

85681

S/056/60/038/006/023/049/XX
B006/B070

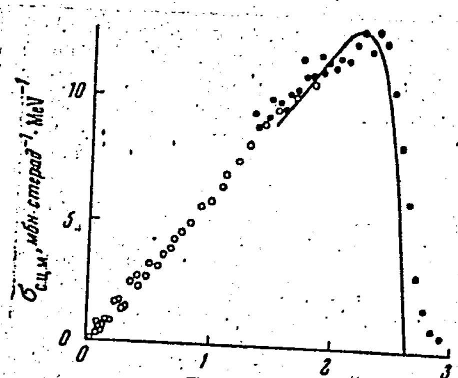


Fig.4

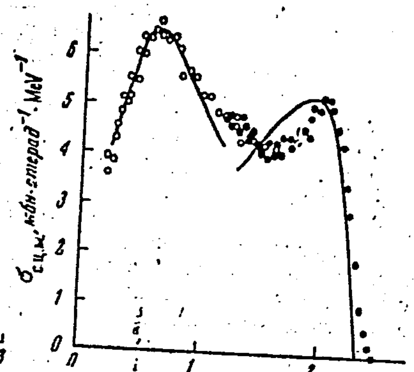


Fig.5

$E_{c.m.s.}$

Card 5/5

86925

S/056/60/039/005/042/051
B006/B077

24.6600

AUTHORS: ~~Vlasov, N. A.;~~ Kalinin, S. P., Ogloblin, A. A., Chuyev, V. I.

TITLE: The (α, t) Reaction With Li^7, Be^9, and Na^{23}

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 5(11), pp. 1468 - 1470

TEXT: The authors report on experimental investigations of the (α, t) reaction with Li^7, Be^9, and Na^{23} with an α energy of 40 Mev in a wide excitation energy range. The final nuclei Be^8, B^{10} and Mg^{24} were also obtained through (d,n) stripping reactions and (d,t) adhesion reactions. The triton spectra, like in investigations of the (d,t) reaction, were determined from the tritium activity which had accumulated on the foils arranged around the target. Foils of the investigated element of 4 mg/cm^2 thickness served as targets. The results of these experiments are only illustrated in diagrams. Fig. 1 shows the angular triton distribution;

Card 1/5

86925

The (α,t) Reaction With Li^7, Be^9, and Na^{23}

S/056/60/039/005/042/051
B006/B077

E^* denotes the level of the final nucleus; the curve shows the calculated square of the spheric Bessel function for given l- and R_o-values. Fig. 2 shows the triton spectra recorded under small angles. In all three cases lines can be observed that correspond to several states of the final nucleus. The angular distribution of most groups can be well described by the squared spherical Bessel function $\left[j_{1+1/2}(qR_o)\right]^2$. Fig. 3 represents a comparison of the level excitation probabilities of the Be^8, B^{10}, and Mg^{24} nuclei in (d,n), (α,t), and (d,t) reactions. The maximum differential cross sections for the (α,t) and the $Na^{23}(d,n)Mg^{24}$ reactions and the reduced widths for the (d,t) and the $Be^9(d,n)B^{10}$ reactions are used for ordinates. There are 3 figures and 10 references: 3 Soviet, 2 British, and 5 US.

SUBMITTED: July 23, 1960

Card 2/5

88434

S/056/60/039/006/023/063
B006/B056

26.2212

AUTHORS: Artemov, K. P., Vlasov, N. A.

TITLE: Charged Products From the Reactions He^4 + d (20 Mev)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 6(12), pp. 1612 - 1614

TEXT: For investigating the (d,pn) splitting mechanism the authors selected the He^4 nucleus, because on it the (d,2n) and (d,2p) reactions have high thresholds and because at an energy of 20 Mev the (d,pn) reaction is the only one that furnishes nucleons with continuous spectrum. Spectra and angular distributions of the He^4+d reaction at 20 Mev were investigated by means of photographic plates. The deuteron energy of 20.2 Mev was determined from the range of the particles after scattering in the emulsion. The plates were arranged at intervals of 15^{o} within the region of 15 - 165^{o} at a distance of 12.5 cm round a gas target; their angle towards the direction of flight of the reaction products was 8^{o}. During evaluation of the plates, such tracks were

Card 1/4

88434
S/056/60/039/006/023/063
B006/B056

Charged Products From the Reactions He^4 + d (20 Mev)

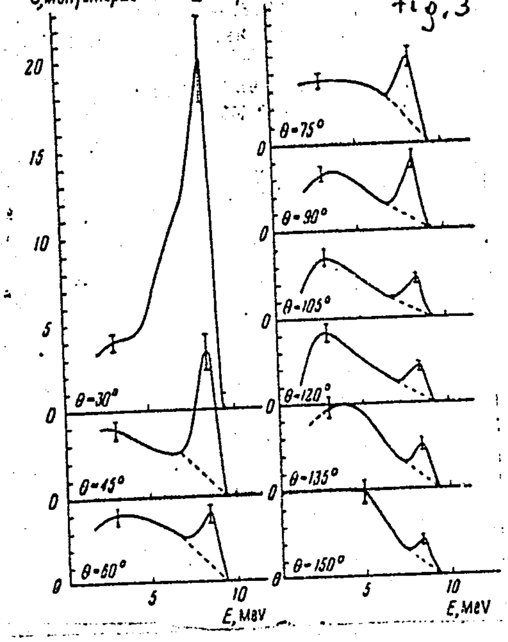
selected as began on the emulsion surface and had a certain direction. The background within the range of the continuous spectrum was $\leqslant$10%. The results obtained are shown in diagrams; thus, Fig.3 shows the spectrum of the protons from the reaction He^4+d for various angles, and Fig.4 shows the proton- and deuteron angular distributions for four processes. Whereas the proton group from the reaction $He^4(d,p)He^5$ (ground state) with increasing angle quickly loses intensity, and at $\theta > 50^{\circ}$ amounts to less than 15% of the continuous one, and also the neutrons from the reaction $He^4(d,n)Li^5$ are mainly observable under an angle of 0°, the fraction of protons of the continuous spectrum originating from (d,pn) reactions is considerable, and the shape of their spectrum does not depend essentially on the angle. The angular distribution of the protons of the continuous spectrum is similar to that of the elastically scattered deuterons and also the cross sections of the two reactions are similar: $\sigma(d,d) = 189 \pm 25$ mb ; $\sigma(d,pn) = 152 \pm 25$ mb. There are 4 figures and 5 references: 1 Soviet, 3 US, and 1 Dutch.

SUBMITTED: July 23, 1960

Card 2/4

88434
S/056/60/039/006/023/063
B006/B056

Fig. 3



Card 3/4

88434

S/056/60/039/006/023/063
B006/B056

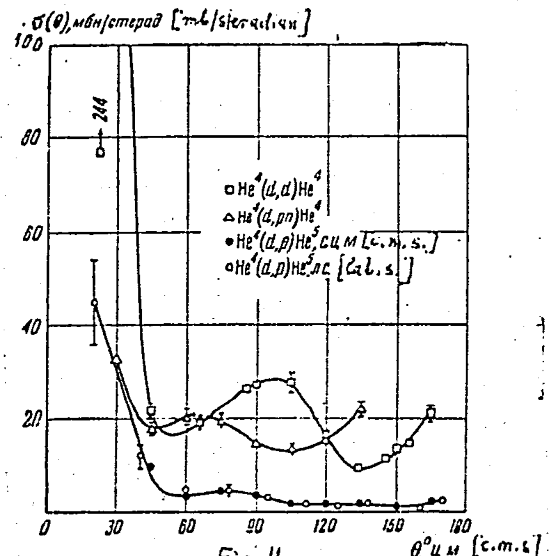


Fig. 4

Card 4/4

88435

26.2225

S/056/60/039/006/024/063
B006/B056

AUTHORS: Vlasov, N. A., Kalinin, S. P., Ogloblin, A. A., Chuyev, V. I.

TITLE: The (d,t) Reaction on Zirconium Isotopes

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 6(12), pp. 1615 - 1617

TEXT: In order to study the effect produced by external neutrons, the authors investigated the (d,t) reactions on $Zr^{91,92,94}$, which have 1, 2, and 4 neutrons above the closed shell with N = 50. The triton spectra were, like in earlier papers (Refs.1-3) determined according to the β-activity of tritium. The tritons emitted from a target of 3-5 mg/cm^2 were caught in piles of aluminum foils arranged under different angles at a distance of 15 cm from the target. The deuterons were accelerated in the cyclotron to 20 Mev. The targets were made from zirconium oxide, enriched in Zr^{91} to 79.5%, in Zr^{92} to 88.6%, and in Zr^{94} to 90.0%, respectively. All three isotopes displayed the existence of two state groups - the first

Card 1/3

88435

The (d,t) Reaction on Zirconium Isotopes

S/056/60/039/006/024/063
B006/B056

corresponds to the ground state, the second to an excited state. The angular distributions of these groups are shown in Fig.2 (upper row: ground state). To the ground-state group there corresponds an $l = 2$; i.e. to a $d_{5/2}$ state, the excited group $l = 1$ and 4 (width ~ 2 Mev). One of the groups corresponds to an ejection of neutrons from a closed shell with neutron binding energies, which are approximately equal and are about 11 - 13 Mev for all zirconium isotopes. In the Zr^{90}(d,t) reaction only this group is to be observed; its intensity decreases slowly from Zr^{90} to Zr^{94}. The other group corresponds to an ejection of an external neutron. The intensity of this group is almost proportional to the number of super-magic neutrons. There are 3 figures and 4 references: 3 Soviet and 1 US.

SUBMITTED: July 23, 1960

Card 2/3

88435

S/056/60/039/006/024/063
B006/B056

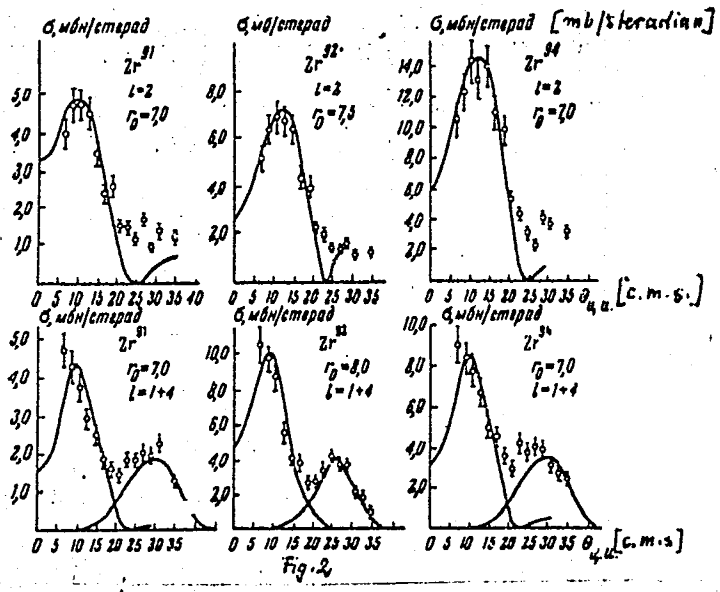


Fig. 2

Card 3/3

S/056/60/039/006/025/063
B006/B056

26.2240

AUTHORS: Vlasov, N. A., Kalinin, S. P., Ogloblin, A. A., Chuyev, V.I.

TITLE: The Reaction $B^{11}(d,t)B^{10}$

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 6(12), pp. 1618 - 1620

TEXT: The $B^{11}(d,t)B^{10}$ reaction was investigated at deuteron energies of 20 Mev; as was the case also in earlier papers (Refs.1-4), the triton spectra according to the β-activity of tritium were accumulated in foil piles around the target (3 mg/cm^2 boron enriched in B^{11} to 81%, upon a 0.4 mg/cm^2 thick Mg backing). Fig.1 shows the triton spectrum recorded at 11^o, B^{10} being produced in the ground and (known) excited states of 0.72, 1.74, 2.15, 3.58, 5.1, and 6.2 Mev. Numerical results of the measurements are tabulated. Also the distribution of the reduced widths θ^2 of the various levels of (d,t) and (d,n) reactions were investigated. The investigations indicated that excitation of the lower levels of B^{10} occurs

Card 1/3

88436

The Reaction $B^{11}(d,t)B^{10}$

S/056/60/039/006/025/063
B006/B056

as a result of the ejection of a neutron with l = 1; the probability for the production of B^{10} in the ground state is several times higher than that for its production in excited states. There are 2 figures, 1 table, and 6 references: 4 Soviet, 1 US, and 1 Dutch.

SUBMITTED: July 23, 1959

Text to the table: 1) B^{10} level, Mev; 2) σ_{max} in the c.m.s., mb/steradian; 3) ground state; 4) isotropic.

Уровень B^{10}, Mev 1	$B^{11}(d,t)B^{10}$				$Be^{9}(d,n)B^{10}$	
	l	r_0, φ	σ_{max} в с. ц. и. 2 мбн/стерад	θ^2, %	l	θ^2
3 Основное состояние	1	6,0	6,4 (15°)	2,47	1	1,7
0,72	1	6,0	1,75(15°)	0,71	1	3,5
1,74	1	7,0	0,95(15°)	0,39	1	2,5
2,15	1	6,0	1,55(15°)	0,72		
3,58	(1)		0,45(15°)	~0,1	1	0,7
4,77			<0,2 (15°)	<0,1(l=1)	(1)	0,3
5,11 } 5,16 }	(1)		0,9 (10—15°)	~0,3	(0)	1,3
5,93					(1)	(0,5)
6,2	изотропно 4		0,6		(1)	0,5

Card 2/3

88436
S/056/60/039/006/025/063
B006/B056

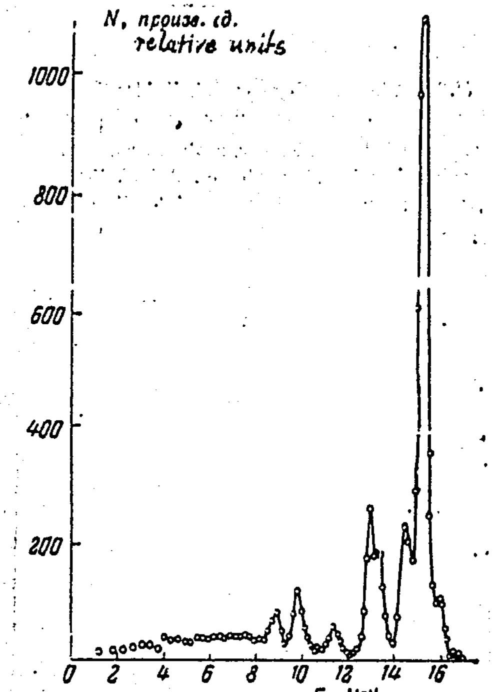


Fig. 1

Card 3/3

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860310005-7"

33086
S/638/61/001/000/008/056
B102/B138

24.6600

AUTHORS: Artemov, K. P., Vlasov, N. A., Samoylov, L. N.

TITLE: Polarization of neutrons of reaction $T(p,n)He^3$, and protons of reaction $He^3(n,p)T$

SOURCE: Tashkentskaya konferentsiya po mirnomy ispol'zovaniyu atomnoy energii. Tashkent, 1959. Trudy. v. 1. Tashkent, 1961, 75-79

TEXT: The polarization of nucleons emitted in $T(p,n)He^3$ and $He^3(n,p)T$ reactions was studied in order to clear up divergences in previous conclusions regarding the He^4 states in the corresponding (p,γ) reactions published by other authors. Polarizations were measured by the method of H. H. Barschall (Helv. Phys. Acta, 29, 145, 956). Noticeable polarization was observed at angles twice the size of Barschall's. The dependence of polarization on angles and energies was investigated. The $T(p,n)He^3$ reaction was studied on a tritium zirconium target with 10-Mev proton bombardment. Protons were decelerated by platinum foils. The protons emitted in the reverse reaction were recorded by a rotating counter telescope. X

Card 1/3

33086
S/638/61/001/000/008/056
B102/B138

Polarization of neutrons of ...

Best results were obtained at E_p = 10 Mev and θ_1 = 40° (angle between direction of neutron emission and proton beam). The right-left asymmetry $R = N_{right}/N_{left} = (1 + P_1P_2)/(1 - P_1P_2)$ was studied. P_1 and P_2 are the polarizations of emitted neutrons and protons, respectively. The $R(\theta_2)$ curves (θ_2 is the angle between neutron directions and proton emission direction) show that $P_1(40°) > P_2(40°)$ for E_p = 9.9 Mev and a Barschall angle of θ_1 = 16.5°. P_1 is about 30% and increases with E_p. This means that the $T(p,n)He^3$ reaction is a good source of polarized neutrons with E_n = 8 Mev or more. The angular dependence of the polarization seems most appropriate for an interference of the $P_{3/2}$ and $P_{1/2}$ states of the emitted nucleons. The first state corresponds to resonance in the $T(p,n)He^3$ reaction with E_p = 3 Mev; however, a resonance may also exist with higher E_p. It follows from the neutron angular distribution that the d-state phases become considerable at E_p = 10 Mev, which makes interpretation of polarization difficult. There are 3 figures and 12 references: 5 Soviet and 7 non-Soviet. The four most recent references to English-language

Card 2/3

33086

Polarization of neutrons of ... S/638/61/001/000/008/056
B102/B138

publications read as follows: Hofstadter R. Rev. Mod. Phys., 28, 214, 1956. Tyren H., Tibell Cr., Marris Th. A. I. Nucl. Phys., 4, 277, 1957. Perry I. E., Bame S. T. Phys. Rev., 99, 1368, 1955. Willard H. B., Bair T. K., Kington T. D. Phys. Rev., 95, 1359, 1954.

ASSOCIATION: Institut atomnoy energii AN SSSR (Institute of Atomic Energy AS USSR)

Card 3/3

33087
S/638/61/001/000/009/056
B102/B138

24,6300

AUTHORS: Vlasov, N. A., Kalinin, S. P., Ogloblin, A. A., Chuyev, V. I.

TITLE: (d,t) reaction on C^{12}, F^{19}, and Al^{27} nuclei

SOURCE: Tashkentskaya konferentsiya po mirnomy ispol'zovaniyu atomnoy energii. Tashkent, 1959. Trudy. v. 1. Tashkent, 1961, 79-84

TEXT: The present investigations continue previous studies (ZhETF 1959, 27, 54) which had shown that in (d,t) reactions on $Li^{6,7}$ and Be^9 the excitation probability decreases rapidly with increasing level energy of the terminal nucleus. The excitation spectrum is here much more complicated than where only hole levels are excited, as neutrons may not only be extracted from outer (2s and 1d), but also from full 1p, shells. The triton spectra were obtained from the β activity of the resulting tritium collected in Al foils. It was eliminated from the plates by heating and conducted into a helium counter. $F^{19}(d,t)F^{18}$ was investigated with a 0.4 mg/cm^2 thick MgF_2 target and an 8.2 mg/cm^2 thick Teflon (CF_2) target

X

Card 1/43

33087
S/638/61/001/000/009/056
B102/B138

(d,t) reaction on C^{12}, F^{19}, ...

at E_d = 20 Mev, $Al^{27}(d,t)Al^{26}$ at E_d = 19 Mev and with a 2.15 mg/cm^2 thick Al target. The Teflon target was also used to study the $C^{12}(d,t)C^{11}$ reaction. The t-angular distributions were compared with results obtained from the Butler theory. The strongest triton group consists of two components (l=0 and l=1). The scheme produced for F^{18} level agrees with that of other authors. Fig. 6 shows the Al^{26} level scheme obtained by other authors together with transitions observed here. Tabulated results show that the (d,t) reactions on F^{19} and Al^{27}, like those on Li^7 and Be^9, have a probability of excitation of the final nuclear levels which decreases rapidly with increasing level energy. The reduced widths of the 3-4 Mev levels are 3-10 times smaller than those of the ground state. Those of 5-7 Mev have 20-30 times less probability of excitation than the ground level. The 3.3-Mev F^{18} level (l=1) has negative parity and comparatively high probability of excitation (width: 0.73%) since a neutron is torn out of the p shell. In Al^{27}, extraction of a neutron with l = 2 is much more probable than one with l = 0, i.e., the inner neutrons of Al^{27} are mainly in the d-state with a small admixture of s-state. r_0 increases with level energy from $4.5\cdot10^{-13}$ cm (C^{12} ground state) to

Card 2/~~4~~3

$9\cdot10^{-13}$ cm (F^{18}, 5.9 Mev). The authors thank D. P. Grechukhin and V. G. Neudachin for a discussion, and the cyclotron team for the irradiations. There are 7 figures, 2 tables, and 15 references: 1 Soviet and 14 non-Soviet. The four most recent references to English-language publications read as follows: Kuchner J. A., Almqvist E., Bromley D. A. Phys. Rev. Lett., 1, 260, 1958. Kuchner J. A., Almqvist E., Bromley D. A. Bull. Am. Phys. Soc., II, 3, 27, 1958. Almqvist E., Bromley D. A., Kuchner J. A. Bull. Am. Phys. Soc., II, 3, 27, 1958. Bennet E. F. Bull. Am. Phys. Soc., II, 3, 26, 1958.

ASSOCIATION: Institut atomnoy energii AN SSSR (Institute of Atomic Energy AS USSR)

X

27522
S/089/61/011/004/003/008
B102/B138

21.3000

AUTHORS: Vlasov, N. A., Kalinin, S. P.

TITLE: Physical research at the cyclotron laboratory of the Institute of Atomic Energy imeni I. V. Kurchatov

PERIODICAL: Atomnaya energiya, v. 11, no. 4, 1961, 345 - 355

TEXT: The article gives the most important data concerning the cyclotron of the Institut atomnoy energii im. I. V. Kurchatova (Institute of Atomic Energy imeni I. V. Kurchatov), and some experiments are described. A complete description of this cyclotron may be found in Ref. 1 (L. M. Nemenov et al., Atomnaya energiya, II, No. 1, 36 (1957)). It was constructed in 1947; in the following years, it was improved by focusing the beam onto a target at 12 m distance. In all operating conditions (parameters are given in a table), the currents reaching a target area of 1 cm^2 amount to some ten microamperes. The electromagnet of the cyclotron weighs 330 tons and has a pole-piece 1.5 m in diameter. With some improvements such as phase and frequency stabilization, the cyclotron can now also be used as a pulsed fast-neutron source for a time-of-flight

X

spectrometer. By adjusting the diaphragm system it is now possible to produce intense and highly monochromatic (energy spread $\leq 0.2\%$) ion beams. One of the main fields of research in the cyclotron laboratory is that of fast-neutron spectrometry. In (d,n) and (α,n) reactions at E_d = 20 Mev and E_α = 40 Mev respectively, neutrons can be obtained with energies up to 40 Mev. The first experiments in this field were in the production of monochromatic neutrons of up to 7 Mev by the reaction $T(p,n)He^3$. Time-of-flight spectrometry experiments were started in 1954. The resolving time of the recording apparatus must be of the same order as the duration of a neutron pulse, i. e., < 2 mμsec. In normal conditions the width of a neutron pulse was not more than 10 mμsec. Investigation of the relationship between pulse shape and cyclotron parameters showed that it was possible to produce doublet pulses without any effect of the pulse width upon resolution. The characteristic resolving time of the spectrometer was 2.5 mμsec. The first single-channel modification of the spectrometer was developed in 1956. Now, a multi-channel spectrometer is in operation, which can be used directly as a high-speed slow-motion camera. It is described in detail by B. V. Rybakov and V. A. Sidorov (cf. Atomnaya

27522
S/089/61/011/004/003/008
B102/B138

Physical research at the...

energiya, 5, no. 2, 135 (1958)). As a final recorder, a 256-channel analyzer of the ЭЛА-2 (ELA-2) type is used. The spectra of fast neutrons from many nuclear reactions, especially of such which may be used for production of monochromatic neutrons, have been investigated. The upper energy limit in these experiments was 15 Mev. The authors discuss special experiments carried out with the use of fast-neutron spectrometry. Some (p,n) and (d,n) reactions in D, T, and He are described in detail. In (d,n) reactions, the 0° neutron spectrum had a peak at $E_n \simeq E_d/2$. A detailed investigation of the continuous neutron spectra showed that the shape of spectra is, in part determined by final-state pair interaction of the particles produced. In D(d,n) and He^3(d,n) reactions, no final-state pair interaction was found. Here the shape of spectra is determined by the energy distribution of three particles. Other fast-neutron experiments have been carried out to study the statistical properties of the nucleus. A third group of such experiments covered the measurement of fission cross sections. A special device has been constructed to study nuclear reactions in which tritium is produced. (For details see N. A. Vlasov, A. A. Ogloblin. Yadernyye reaktsii pri malykh i srednykh energiyakh -

Card 3/4

27522
S/089/61/011/004/003/008
B102/B138

Physical research at the...

Nuclear reactions at low and medium energies, M. Izd-vo AN SSSR, 1958). Some results of (d,t) reactions in Li^7, O^{18}, F^{19}, and $Zr^{91,92,94}$ are discussed. There are 14 figures and 23 references: 17 Soviet and 6 non-Soviet. The three most recent references to English-language publications read as follows: B. W. Rybakov, W. A. Sidorov, N. A. Vlasov. Nucl. Physics, 23, 491 (1961); E. Hamburger, B. Cohen, R. Price. Preprint, 1960; N. Lassen, V. Sidorov. Nucl. Physics, 19, 579 (1960).

SUBMITTED: May 27, 1961

Card 4/4

89255

S/048/61/025/001/021/031
B029/B063

24.6600

AUTHORS: Vlasov, N. A., Kalinin, S. P., Ogloblin, A. A., Chuyev, V. I.

TITLE: (d,t) Reactions of O^{16}, O^{18}, Mg^{24}, Mg^{25}, and Mg^{26} nuclei

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, v. 25, no. 1, 1961, 115-120

TEXT: This is the continuation of previous papers (Refs. 1, 2, 3) on the (d,t) reaction. A study of the latter makes it possible to determine the degree of conservation of single-particle states in the inner, completely filled shells of nuclei. If these states are conserved, it is possible to determine the neutron binding energy in the shells or the neutron transition energy between them. The nuclei of O^{16}, O^{18}, Mg^{24}, Mg^{25}, and Mg^{26} have completely filled 1s and 2p shells and different numbers of neutrons in the outer shell $1d_{5/2}$-$2s_{1/2}$. Like in Refs. 1-3 and 7, the deuteron energy was found to be about 20 Mev, and the triton spectrum was determined from the activity of tritium. MgO^{18} (60% O^{18}), $Mg^{25}O$ (86% Mg^{25}),

Card 1/7

29255

$Mg^{26}O$ (90.5% Mg^{26}), and a foil of natural magnesium served as targets. Fig. 1 shows typical spectra for each target. In addition to the tritons resulting from (d,t) reactions of O^{18} and magnesium isotopes, a large group of tritons was produced by (d,t) reactions of O^{16} at E_t = 10.5 Mev. In the reaction O^{18} $(d,t)O^{17}$, four groups of tritons are observed, which correspond to the ground state and to the three excited states of O^{17} having energies of 0.87, 3.06, and 5.3 Mev. Fig. 2 shows the angular distributions of the four groups, which agree with the angular momenta l = 2, 0, 1 and 1 of the neutron. There were intense transitions to the ground state (l = 2) and to the first excited state (l = 0). The configurations $(d_{5/2})^2$ and $(s_{1/2})^2$ in the nucleus of O^{18} are strongly intermixed, and there is only a slight admixture of the configuration $(d_{3/2})^2$. The probability ratio of the configurations $(d_{5/2})^2$, $(s_{1/2})^2$, and $(d_{3/2})^2$ in the ground state of O^{18} is $(d_{5/2})^2/(s_{1/2})^2 = 3.9 \pm 1.0$ and $(d_{5/2})^2/(d_{3/2})^2 > 10$. In the case of O^{18}, the weakest binding is that of

89255

(d,t) Reactions of O^{16}, O^{18}, ...

S/048/61/025/001/021/031
B029/B063

the d-neutron, while in the case of F^{19}, it is that of the s-neutron. The 3.06-Mev and 5.3-Mev levels are excited by ejection of a p-neutron. It is noted that the 3.058-Mev level has a negative parity and a 1/2-spin. The 3.06-Mev and 5.38-Mev states are of the hole type. In this way, the authors were able to calculate the values of neutron binding energy in the O^{18} and F^{19} nuclei for different states. The ground state of Mg^{23} and a group of states are very likely to be excited in the reaction $Mg^{24}(d,t)Mg^{23}$ at an energy of about 2.5 Mev. The angular distribution of the first group (Fig. 3) is in good agreement with l = 2. The angular distribution of the second group may have different components corresponding to l = 2, l = 1, etc. In the case of Mg^{24}, the s- and d-shells are probably much less intermixed than in the case of O^{18} and F^{19}. The group of tritons appearing in the reaction $Mg^{25}(d,t)Mg^{24}$ corresponds to the formation of Mg^{24} in the ground state and in excited states having energies

Card 3/7

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R001860310005-7"

of 1.37, 4.12, 4.23 (not resolved), 6.0, and 7.8 Mev. Five groups of tritons have been found in the reaction $Mg^{26}(d,t)Mg^{25}$. These groups correspond to the well-known levels of the Mg^{25} nucleus. The results obtained for the reaction $Mg^{26}(d,t)Mg^{25}$ can be explained by the shell model if the neutron in Mg^{26} is in the d-state, with a small admixture of the s-state. The principal results of the present work are illustrated in Table 3. The authors thank the co-workers of the cyclotron laboratory for irradiations; V. S. Zolotarev and his co-workers for the preparation of enriched Mg^{25} and Mg^{26} isotopes; and V. M. Strutinskiy and A. I. Baz' for a discussion. This is the reproduction of a lecture read at the Tenth All-Union Conference on Nuclear Spectroscopy, Moscow, January 19-27, 1960. There are 6 figures, 3 tables, and 11 references: 4 Soviet-bloc and 7 non-Soviet-bloc.

ASSOCIATION: Institut atomnoy energii im. I. V. Kurchatova (Institute of Atomic Energy imeni I. V. Kurchatov)

(d,t) Reactions of O^{16}, O^{18}, ...
Card 5/7

S/048/61/025/001/021/031
B029/B063

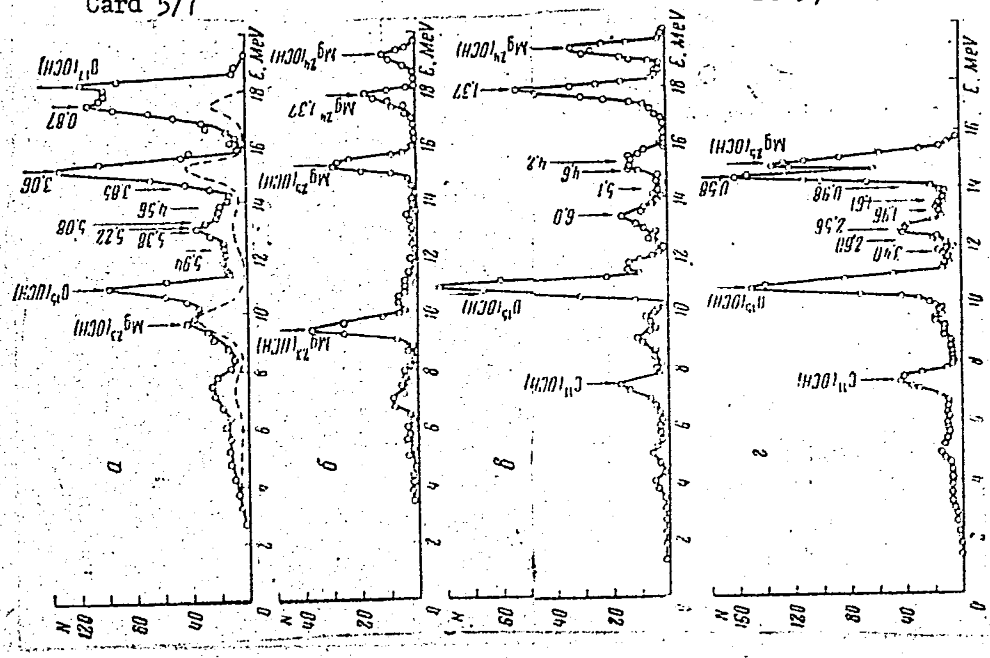


Рис. 1. Спектры тритонов для мишеней: а — MgO^{18}, $\theta = 9°$; б — Mg (естеств.), $\theta = 13°$; в — $Mg^{25}O$, $\theta = 11°$; г — $Mg^{25}O$, $\theta = 7°$

89255

S/048/61/025/001/021/031
B029/B063

(d,t) Reactions of O^{16}, O^{18}, ...

Fig. 3

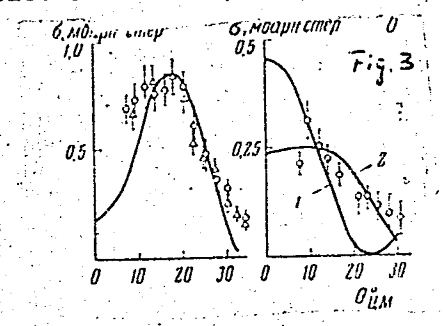


Table 1: Neutron binding energies in O^{18} and F^{19}, Mev.

Nucleus	$d_{5/2}$	$s_{1/2}$	$p_{1/2}$	$p_{3/2}$
O^{18}	8.07	8.94	11.1	13.3
F^{19}	11.5	10.4	13.7	-

Card 6/7

(d,t) Reactions of O^{16}, O^{18}, ... S/048/61/025/001/021/031
B029/B063

Legend to Table 3:
1) residual nucleus;
2) energy of state
(O_{CH} = ground state);
3) σ_{max} in mb/steradian,
θ^{o} in the center-of-mass system

Остаточное ядро 1	Энергия состояния, MeV 2	$\sigma_{макс}$, мбарн стер$^{-1}$ θ° ц.м. 3	l	$r_0 \cdot 10^{-13}$ см	θ^2, %
O^{15}	Осн.	3,2 (10°)	1	5,5	1,4
	5,2	0,15	—	—	—
O^{17}	Осн.	3,4 (15°)	2	6,5	1,75
	0,87	2,0 (10°)	0	6,5	1,3
	3,06	1,9 (10°)	1	7,0	0,55
	5,08	<0,3 (15°)	—	—	<0,15 l=2
	5,2	0,7 (10°)	1	6,5	0,3
Mg^{23}	Осн.	0,85 (18,5°)	2	7,0	0,81
	2,5	0,25 (12°)	2 (1)	7,0	0,3 (l=2)
Mg^{24}	Осн.	1,47 (8°)	2	7,0	0,74
	1,37	2,20 (14,5°)	2	7,0	1,27
	4,1+4,2	0,9 (17°)	2	7,0	0,71
	6,0	0,8 (14,5°)	2	7,0	0,51
	7,8	0,5 (17°)	—	—	—
Mg^{25}	Осн.	5,0 (17,5°)	2	6,5	3,30
	0,58	1,38 (10°)	0	7,0	0,29
	0,98	0,12	(2)	(7)	0,09
	1,96 (1,61)	0,4 (18°)	2	7,0	0,34
	2,56	0,45 (10°)	0	7,0	0,09
	2,80	0,3 (20°)	2	7,0	0,30
	3,40	0,3 (20°)	2	7,0	0,22

Card 7/7

88564

S/020/61/136/001/009/037
B019/B056

24.6600 (1138, 1160, 1158)

AUTHORS: Brill', O. D., Vlasov, N. A., Kalinin, S. P., and Sokolov, L. S.

TITLE: The (n,2n)-Reaction Cross Section for C^{12}, N^{14}, O^{16} and F^{19} in the Energy Interval of From 10 - 37 Mev

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No. 1, pp. 55-57

TEXT: In the tests described here, the reactions $D(d,n)He^3$ and $T(d,n)He^4$ were used for the neutron production; they were induced by means of 20 Mev deuterons. The experiments were made on the cyclotron of the Institut atomnoy ei ~rgii AN SSSR (Institute of Atomic Energy, AS USSR). The neutron energy was changed into platinum foils by slowing-down. Solid T+Zr-targets and gaseous deuterium targets were used. In bombarding the deuterium and tritium targets with fast deuterons, also neutrons with a continuous spectrum were formed besides the monochromatic neutron group, due to (d,pn) and (d,2n) reactions. The intensity of the continuous spectrum exceeds that of the monochromatic spectrum somewhat, but there exists an upper energy limit, which is about $E_n \simeq E_d - 4$ Mev. For the

X

Card 1/4

88564

The (n,2n)-Reaction Cross Section for C^{12}, N^{14}, O^{16} and F^{19} in the Energy Interval of From 10 - 37 Mev

S/020/61/136/001/009/037
B019/B056

recording of the relative (n,2n) reaction yield with various neutron energies, special carbon, NH_4NO_3 and CF_2 specimens were produced. They were irradiated with neutrons at an angle of 0^{o} under standard conditions; the β-particles were measured by means of a Geiger counter. The decay curves of the specimens were determined. The background caused by the target backing in the case of O^{15} amounted to 30%, with N^{13} to 80%, and in the case of F^{18} to 88%. The absolute cross section of the (n,2n) reaction was determined for carbon at E_n = 34 Mev, and for fluorine at E_n = 25 Mev and 14 Mev. The absolute cross section for nitrogen and oxygen was measured by comparing the annihilation γ-activity of NH_4NO_3 and water with the γ-activity of a carbon specimen by means of a scintillation counter. The results are graphically represented in Figs. 1-4. B.V. Rybakov and L. S. Sokolov are mentioned. There are 4 figures and 14 references: 4 Soviet, 1 French, 1 Canadian, and 1 US.

PRESENTED: July 8, 1960, by A. P. Aleksandrov, Academician

Card 2/4

88564

The (n,2n)-Reaction Cross Section for C^{12}, N^{14}, O^{16} and F^{19} in the Energy Interval of From 10 - 37 Mev

S/020/61/136/001/009/037
B019/B056

SUBMITTED: April 4, 1960

Legend to Fig. 1: Cross section of the reaction $C^{12}(n,2n)C^{11}$. a) Data according to Brolley et al. (Ref. 6).
Legend to Fig. 2: Cross section of the reaction $N^{14}(n,2n)N^{13}$. a) Data according to Paul et al. (Ref. 1). σ) Data according to Dudley et al. (Ref. 2). ϐ) Data according to Ashby et al. (Ref. 3).
Legend to Fig. 3: Cross section of the reaction $O^{16}(n,2n)O^{15}$.
Legend to Fig. 4: Cross section of the reaction $F^{19}(n,2n)F^{18}$. a) Data according to Paul et al. (Ref. 1). σ) Data according to Rayburn et al. (Ref. 4). ϐ) Data according to Ashby et al. (Ref. 3)

X

Card 3/4

80564
S/020/61/136/001/009/037
B019/B056

Fig. 1

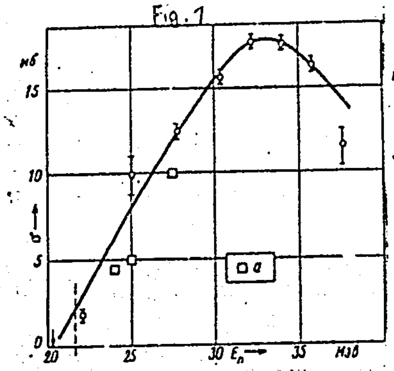


Fig. 2

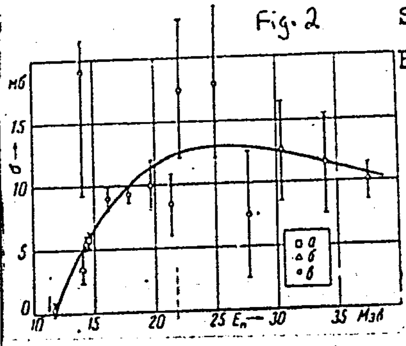


Fig. 3

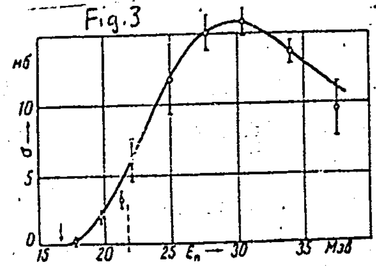
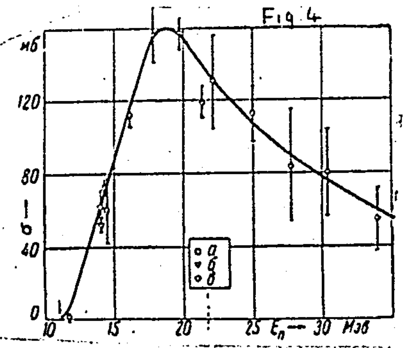


Fig. 4



Card 4/4

S/903/62/000/000/002/044
B102/B234

AUTHORS: Rybakov, B. V., Sidorov, V. A., Vlasov, N. A.

TITLE: Deuteron disintegration on H, D, He^3 and He^4 nuclei

SOURCE: Yadernyye reaktsii pri malykh i srednikh energiyakh; trudy Vtoroy Vsesoyuznoy konferentsii, iyul' 1960 g. Ed. by A. S. Davydov and others. Moscow, Izd-vo AN SSSR, 1962, 33-37

TEXT: To investigate the mechanism whereby fast deuterons interact with light nuclei the spectrum of the neutrons produced in these interactions was investigated with the help of a time-of-flight spectrometer. The measurements were made at the 1.5-m cyclotron of the IAE AN SSSR; gas targets with Ni windows were used and all spectra were measured of neutrons emitted at 0^o or 180^o with respect to the incident deuteron beam. The center-of-mass spectrum $\sigma(E)$ of p+d reactions at 0^o angles increases almost linearly up to ~ 2.3 Mev and then suddenly drops with a small tail toward 3 Mev; the spectrum of the neutrons emitted at 180^o with respect to the deuteron momentum has a maximum at about 0.6 Mev (corresponding to p+n reaction) and another at 2.2 Mev (p+p). The neutron spectra of the reaction d+d (0^o) has a broad maximum at ~ 3 Mev (range 0-6 Mev), that of He^3+d (0^o) one at ~ 4 Mev

Card 1/2

(range 0-7 Mev), that of α+d (0^{o}) one at $\sim$7 Mev, corresponding to Li^7 formation (range 2-9 Mev) and that of α+d (180^{o}) a peak at $\sim$2 Mev, corresponding to He^5 formation and a hardly remarkable hill corresponding to Li^5 formation. In several reactions, such as d+d→d+p+n or α+d→α+p+n, the p+n pair formation in the singlet S-state is forbidden by selection rules with respect to isotopic spin. This is the reason why there are no maxima observed whose position would correspond to p+n pair formation, with the exception of the He^3+d reaction where no forbiddenness exists; in the latter case σ_{max} is only somewhat shifted from the p+n position to higher energies by reason of the necessity for spin rotation of one of the nucleons of the deuteron, a fact which reduces the probability of the process. In the case of d+d the neutron spectrum corresponds to and 1:1 mixture of the states $l_1=0$, $l_2=1$, $l_1=l_2=1$, and He^3+d to $l_1=l_2=1$, where l_1 is the relative orbital angular momentum of proton and target nucleus in the final state and l_2 that of neutron and center of mass of the first two particles. There are 6 figures and 1 table.

ASSOCIATION: Institut atomnoy energii im. I. V. Kurchatova AN SSSR (Institute of Atomic Energy imeni I. V. Kurchatov AS USSR)

Card 2/2

VLASOV, N. A. (Moscow)

"Continuous Neutron Spectra from Light Nuclei."

report to be submitted for the Intl. Conference in Fast Neutron Physics, Houston, Texas, 26-28 Feb 1963

Inst. of Atomic Energy, Moscow

S/089/63/014/001/005/013
B102/B186

AUTHOR: Vlasov, N. A.

TITLE: Delayed protons (No. 1 ?)

PERIODICAL: Atomnaya energiya, v. 14, no. 4, 1963, 45-47

TEXT: Delayed neutrons or protons are emitted following a β decay if the decay energy is larger than the binding energy of nucleon concerned. In the N(Z) diagram for $10 < Z \leqslant 30$ there is a band where $E_\beta > B_n > 0$ with 7-15 isotopes for each element which can emit delayed neutrons, and a band in which $E_\beta > B_p > 0$ with 4-6 isotopes per element which can emit delayed protons. $E_{p(n)}$ is the binding energy of the proton (neutron) in the final nucleus. The greater part of these possible reactions has not yet been observed. For the same energy the emission probability for a proton is essentially smaller than that for a neutron; that is, the necessary energy differences are essentially higher for protons. While $\Delta E_n > 50$kev, ΔE_p is a few Mev. Light nuclei with proton excess are easy to produce

Card 1/2

Delayed protons

S/089/63/014/001/005/013
B102/B186

by the He^3 bombardment of suitable nuclei at which the reaction (He^3, 2n) takes place. The emission probability for delayed neutrons is given by

$$P(B) = \frac{\int_B^{E_\beta} (E_\beta - E)^5 e^{2\sqrt{aE}} dE}{\int_0^{E_\beta} (E_\beta - E)^5 e^{2\sqrt{aE}} dE}.$$

For E_β=11 Mev, the dependence of the proton emission probability on the binding energy is given by a steeply falling curve whose steepness depends on the choice of the constant a. For a=3 Mev^{-1} it is steeper than for a=1 Mev^{-1}. There are 2 figures and 1 table.

SUBMITTED: September 27, 1962

Card 2/3

L 14933-63 EWT(m)/BDS AFFTC/ASD DM

ACCESSION NR: AP3003979 S/0089/63/015/001/0062/0064

AUTHORS: Alekseyev, N. V.; Arifkhanov, U. R.; Vlasov, N. A.; Da y*dov, V. V.; Samoylov, L. N.

TITLE: Apparatus for the study of polarization of fast neutrons 19 57

SOURCE: Atomnaya energiya, v. 15, no. 1, 1963, 62-64 56

TOPIC TAGS: fast neutron , neutron polarization, neutron scattering, He

ABSTRACT: The cyclotron laboratory of the Institute for Atomic Energy is planning to study polarized neutrons in the energy range from 5 to 40 mev. The paper describes the apparatus assembled for this purpose, and the results of neutron polarization measurements from the reaction $T(p,n) He^3$ conducted with this apparatus. For the analysis of polarized neutrons, their scattering on He^4 under 123F was used. Helium pressure was 100 atm., scintillations from Alpha particles were recorded with a photomultiplier; the scattered neutrons - with scintillation counters. The coincidence of both counts registered the events of neutron-Alpha scattering. For elimination of geometrical assymetry, a solenoid was used which rotated the polarized neutrons by 90 degrees. The neutron polarization was found to be 28.6 plus or minus 4.1% for proton energy of 10.5 mev. incident under 40F. A detailed description of apparatus is given in a preprint of the Inst. for Atomic Energy

Card 1/2

L 16879-63 EPF(n)-2/EWT(m)/BDS AFFTC/ASD/SSD Pu-4

ACCESSION NR: AP3005272 S/0056/63/045/002/0228/0230

AUTHOR: Vlasov, N. A. 58

TITLE: Spatial correlation of nucleons in light nuclei 19

SOURCE: Zhur. eksper. i teoret. fiz., v. 45, no. 2, 1963, 228-230

TOPIC TAGS: pairing energy, light nuclei, Coulomb energy difference spatial correlation, isobaric triplet

ABSTRACT: In order to clarify the connection between pairing energy effects and the spatial correlation of paired nucleons, Coulomb energy differences of isobaric triplets of light nuclei are calculated on the basis available published data by a method described by Kofoed-Hansen (Rev. Mod. Phys. v, 30, 449, 1958). Also calculated is the quantity $\gamma = ZQ(p,p)/Q(p,Z)$ (Q-Coulomb energy), which can serve as a spatial-correlation coefficient for the pair of last nucleons in the triplet. This quantity exceeds unity in all cases, indicating a large mutual Coulomb energy of the pair of outside protons, and consequently a large spatial correlation between them. Orig. art. has 2 formulas and 1 table.

ASSOCIATION: None

SUBMITTED: 15Jan63 DATE ACQ: 06Sep63 ENCL: 01

SUB CODE: PH NO REF SOV: 002 OTHER: 007

Card 1/2

ALEKSEYEV, N.V.; ARIFKHANOV, U.R.; VLASOV, N.A.; DAVYDOV, V.V.;
SAMOYLOV, L.N.

Neutron polarization in the reactions T(p, n)He^3 and D(d, n)He^3.
Zhur. eksp. i teor. fiz. 45 no.5:1416-1424 N '63. (MIRA 17:1)

VLASOV, N.A., doktor fiziko-matematicheskikh nauk (Moskva)

Isotopes of hydrogen and neutron. Priroda 52 no.8:75-77 Ag '63. (MIRA 16:9)

(Hydrogen isotopes) (Neutrons)

VLASOV, N. A.; SAMOYLOV, L. N.

"Concerning Heavy Isotopes of Hydrogen."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, 14-22 Feb 64.

Inst Atomic Energy, AS USSR

S/0089/64/017/001/0003/0009

ACCESSION NR: AP4042256

AUTHORS: Vlasov, N. A.; Samoylov, L. N.

TITLE: Concerning heavy hydrogen and neutron isotopes

SOURCE: Atomnaya energiya, v. 17, no. 1, 1964, 3-9

TOPIC TAGS: heavy particle, hydrogen, neutron, isotope, binding energy, isotopic spin

ABSTRACT: In view of the considerable interest in this question, the authors review the latest experimental data on the states of four- and five-nucleon nuclei. The data confirm the existence of three unbound excited states of He^4 (20.1 MeV, 0^+, $T = 0$; 22 MeV, 2^-, $T = 0$; 24--25 MeV, 1^-, $T = 1$). The isobar nuclei H^4 and Li^4 have no bound states and their lifetime is on the order of 10^{-22} sec. The nucleus H^5 has likewise no bound state and decays into $H^3 + 2n$ with energy $Q \geq 1$ MeV and a lifetime on the order of 10^{-22} sec. The reported

Card 1/2

ACCESSION NR: AP4042256

radioactivity of H^5 is in error. An analysis of the binding energy of nuclei with known masses indicates that there is likewise no bound state of n^4. Several arguments are advanced to demonstrate that H^4, H^5, and n^4 as well as the heavier hydrogen and neutron isotopes lie beyond the limits of stability with respect to decay with nucleon emission. Nevertheless, it is concluded that the determination of the energy of the virtual states in these and other unstable nuclei is of interest from the point of view of determining the position of the stability limit and the isotopic spins of excited states of isobar states. The results can also cast light on the possible existence of neutron drops with density lower than nuclear. Orig. art. has: 6 figures.

ASSOCIATION: None

SUBMITTED: 13Feb64 ENCL: 00

SUB CODE: NP NR REF SOV: 015 OTHER: 031

Card 2/2

ACCESSION NR: AP4043612 S/0056/64/047/002/0433/0438

AUTHORS: Alekseyev, N. V.; Arifkhanov, U. R.; Vlasov, N. A.; Davy*dov, V. V.; Samoylov, L. N.

TITLE: Polarization of neutrons in the reaction $T(d, n)He^3$

SOURCE: Zh. eksper. i teor. fiz., v. 47, no. 2, 1964, 433-438

TOPIC TAGS: neutron reaction, polarization, deuteron scattering, tritium, alpha particle reaction

ABSTRACT: This is a continuation of earlier research with He^3 (ZhETF v. 45, 1416, 1963) and is aimed at attaining polarized neutrons of higher energy than in the past. The energies of the incident deuterons ranged from 9 to 19 MeV and analysis was by means of scattering from a gaseous helium scintillator connected for a coincidence circuit with two neutron counters. To exclude the effects of geometrical asymmetry, the neutron spin was turned through 90° in the

ACCESSION NR: AP4043612

longitudinal magnetic field of a solenoid, with the reversal of the scattering direction from left to right and vice versa being produced by reversing the direction of the current in the solenoid. The polarization of the neutrons in the reaction $T(d, n)He^4$ at a laboratory angle close to 30° exceeds 50% over a wide range of deuteron energies, so that strongly polarized neutrons with energy up to 40 MeV can be produced by this reaction. Resonance effects previously observed upon variation of the cross section of the reactions $T(d, n)He^4$ in the ground and 20-MeV excited states, as well as in dT scattering, were also observed in the present results. These resonance effects must be taken into account in the phase shift analysis of the α-n scattering, and are connected with the excited states of the He^5 nucleus (16.7 and 20 MeV). "The authors are grateful to S. P. Kalinin and N. I. Venikov for interest in the work and for ensuring operation of the cyclotron, and also V. A. Kovtun and V. A. Stepanenko for preparing the tritium targets." Orig. art. has: 4 figures and 1 table.

ACCESSION NR: AP4043612

ASSOCIATION: None

SUBMITTED: 02Mar64 ENCL: 02

SUB CODE: NP NR REF SOV: 003 OTHER: 014

Card 3/5

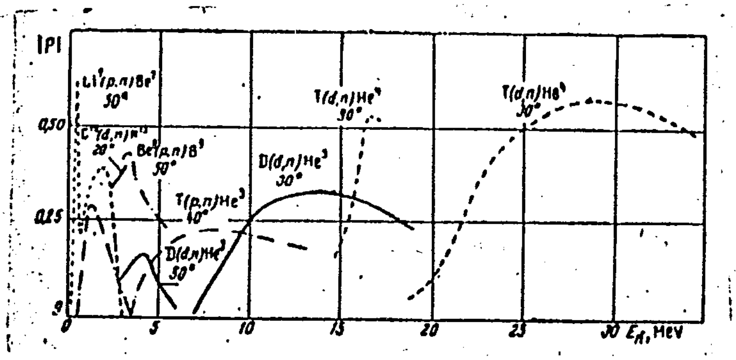
ACCESSION NR: AP4043612 ENCLOSURE: 01

Summary data on neutron polarization

E_d, MeV	$\theta_{1лаб}$, град lab.deg.	E_n, MeV	$\theta_{2лаб}$, град	ε, %	$\bar{P}_1$, %	P_1, %
8,7±0,7	30	24,7	123	36,0±2,6	67,2	53,7
11,0±0,6	30	26,9	123	38,0±3,6	69,7	54,5
11,7±1,0	30	27,5	123	39,2±2,3	74,0	53,0
12,2±0,5	30	28,0	123	43,9±3,4	75,0	58,6
13,1±0,9	30	28,8	123	45,3±3,0	76,2	59,5
15,4±0,9	30	30,0	123	41,4±4,2	80,3	51,6
17,3±0,8	30	32,6	123	37,5±4,3	82,5	45,5
19,0±0,8	15	35,0	123	4,1±5,1	84,6	4,8
19,0±0,8	30	34,1	123	36,5±4,4	83,1	44,0
19,0±0,8	45	31,4	123	15,6±3,2	70,6	19,6
19,0±0,8	73	25,2	123	12,6±5,9	68,0	18,5
19,0±0,8	92	21,1	123	−12,2±10,3	58,8	−20,7
19,0±0,8	30	34,1	103	13,4±6,5		
19,0±0,8	30	34,1	135	38,2±6,6		
19,0±0,8	30	34,1	145	30,3±4,8		

Card 4/5

ACCESSION NR: AP4043612 ENCLOSURE: 02



Neutron polarization in different nuclear reactions

Card 5/5

TITLE: Antimatter and the Universe

SOURCE: Priroda, no. 9, 1964, 20-25

TOPIC TAGS: antimatter, Universe symmetry, cosmology, Galaxy, gamma astronomy, matter annihilation

ABSTRACT: This article discusses the fundamental problems concerning the symmetry of the Universe with respect to matter and antimatter in popular terms. It notes that the present state of the physical and astrophysical investigations cannot resolve this problem.

Card 1/2

L 10587-65
ACCESSION NR: AP4045506

time. Some methods of observing antimatter are examined, and the article draws attention to the importance of developing experimental methods for detecting antimatter, in particular, to the most effective methods of gamma-astronomy and optical astrophysics. It concludes that the process of annihilation [illegible] one of the possible causes of some observed but not yet explained astronomical [illegible]

Card 2/2

EWL/SSD ESD(t)

S/0053/64/083/004/0741/0752

Davydov, V. V.; Samoylov, L. N.

TITLE: Sources of polarized fast neutrons

SOURCE: Uspekhi fizicheskikh nauk, v. 83, no. 4, 1964, 741-752

TOPIC TAGS: neutron polarization, deuteron bombardment, proton

scattering

review devoted primarily to

sources of fast polarized medium

35 Mev). The history of FPN research and some of the problems that

are briefly reviewed. Along with men-

measurements and

their advantages

stallation used for this purpose at the Institut atomnoy energii im-

1/5

Kurchatova, in which a Hillman solenoid (P. Hillman et al., Nuovo Cimento v. 6, 67, 1956) is used to rotate the nucleon spin through 90° in a magnetic field. Installations of this type can measure simultaneously the polarization of neutrons in a wide spectral range. Another method especially mentioned is the polarization [illegible]

[illegible] as polarized neutron sources. Although the number of reactions investigated so far is small, the production of neutrons with [illegible] feasible at energies of [illegible] MeV, [illegible]

ASSOCIATION: None

L 13763-65
ACCESSION NR: AP4044581

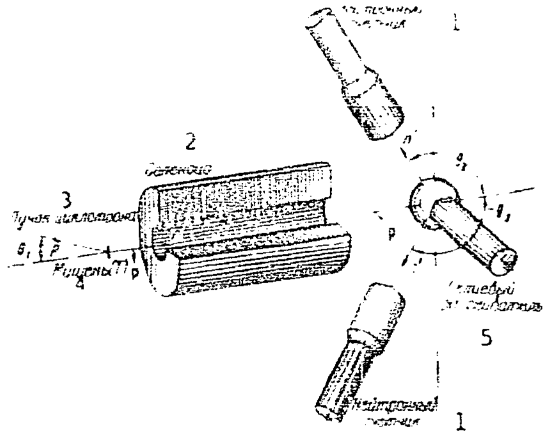
SUBMITTED: 00 ENCL: 02

SUB CODE: NP NO REF SOV: 014 OTHER: 031

3/5

L 13763-65
ACCESSION NR: AP4044581

ENCLOSURE: 01



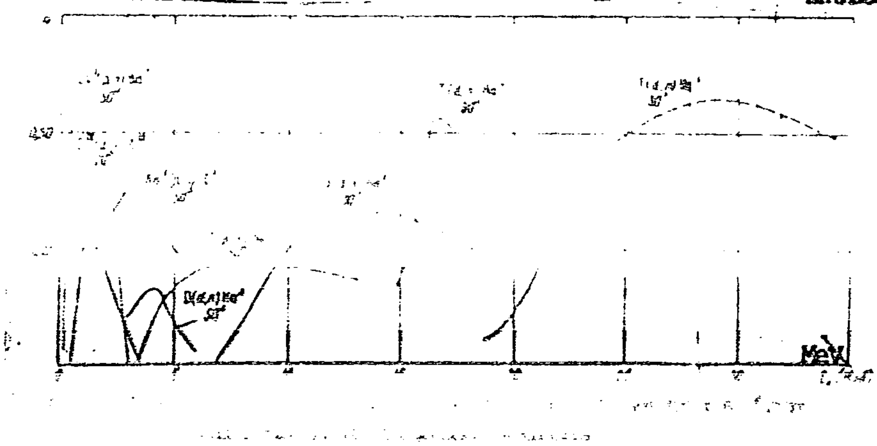
1 - neutron counter
2 - solenoid
3 - cyclotron beam
4 - target (T)
5 - helium scatterer

Fig. 1. Diagram of setup for the measurement of fast-neutron polarization

Card 4/5

L 13763-65
ACCESSION NR: AP4044581

ENCLOSURE: 02



Card ./5

L 17854-65 EWT(1)/EWG(v)/EEC(t)/EWA(m)-2 Pe-5/Pae-2 JFW/GW

ACCESSION NR: AP4047153 S/0033/64/041/005/0893/0897

AUTHOR: Vlasov, N. A.

TITLE: An optical method for the detection of antimatter in the universe

SOURCE: Astronomicheskiy [illegible] 893-897

TOPIC TAGS: antimatter, antimatter detection, positronium emission, antiparticle, protonium emission

ABSTRACT: The possibility of the existence of antimatter in the universe and methods for its detection are discussed in connection with the electromagnetic separation of matter and antimatter [illegible] Alfven and Klein. An optical method [illegible] result of annihilation. The [illegible] emission [illegible] the boundaries [illegible] regions of matter and antimatter, where there is a mixture of particles and antiparticles [illegible] trated regions [illegible] scopes. Emission from [illegible] of interest [illegible] the sources

Card 1/2

L 17854-65
ACCESSION NR: AP4047153

0

of soft rays from the galactic center may be protonium. Orig. art. has: 3 formulas.

ASSOCIATION: none

SUBMITTED: 04Dec63 ENCL: 00 SUB CODE: AA

NO REF SOV: 005 OTHER: 015

Card 2/2

VLASOV, N.A.; MORGEN, E.A.

Photocolorimetric determination of calcium in the liquid phase of flotation pulps using the arsenazo-1 reagent. Zhur. prikl. khim. 38 no.5:998-1004 My '65. (MIRA 18:11)

TKACHUK, V.G., doktor geologo-mineralog. nauk; TOLSTIKHIN, N.I., prof.; PINNEKER, Ye.V., kand. geologo-mineralog. nauk, mladshiy nauchnyy sotr.; YASNITSKAYA, N.V., mladshiy nauchnyy sotr., khimik; KRUTIKOVA, A.I., mladshiy nauchnyy sotr., khimik; SHOTSKIY, V.P., kand. geogr. nauk; ORLOVA, L.M., starshiy gidrogeolog; STEPANOV, V.M., kand. geologo-mineralog. nauk; VLASOV, N.A., kand. khim. nauk; PROKOP'YEV, B.V., kand. khim. nauk; CHERNYSHEV, L.A., starshiy prepodavatel'; PAVLOVA, L.I., starshiy prepodavatel'; Prinimali uchastiye: IVANOV, V.V., kand. geologo-mineralog. nauk; YAROTSKIY, L.A., kand. geologo-mineralog. nauk; KARASEVA, A.P., nauchnyy sotr.; ARUTYUNYANTS, R.R., nauchnyy sotr.; ROMANOVA, E.M., nauchnyy sotr.; TROFIMUK, P.I., starshiy gidrogeolog; LADEYSHCHIKOV, P.I., starshiy nauchnyy sotr., kand. geogr. nauk; LYSAK, S.V., starshiy laborant; KRUCHININA, L.Yu., laborant; SEMENOVA, Ye.A., red. izd-va; BOCHEVER, V.T., tekhn. red.

[Mineral waters of the southern part of Eastern Siberia] Mineral'nye vody iuzhnoi chasti Vostochnoi Sibiri. Moskva. Vol.1. [Hydrogeology of mineral waters and their significance for the national economy] Gidrogeologiia mineral'nykh vod i ikh narodnokhoziaistvennoe znachenie. Pod obshchei red. V.G.Tkachuk i N.I.Tolstikhina. 1961. 346 p. (MIRA 14:8)

1. Akademiya nauk SSSR. Sibirskoye otdeleniye. Vostochno-sibirskiy geologicheskiy institut. (Continued on next card)

TKACHUK, V.G.--- (continued) Card 2.

2. Vostochno-Sibirskiy geologicheskiy institut (for Tkachuk, Pinneker, Yasnitskaya, Krutikova, Lysak). 3. Institut geografii Sibirskogo otdeleniya Akademii nauk SSSR (for Shotskiy). 4. Chitinskoye geologicheskoye upravleniye (for Orlova). 5. Sosnovskaya ekspeditsiya Ministerstva geologii i okhrany nedr SSSR (for Stepanov). 6. Irkutskiy gosudarstvennyy universitet (for Vlasov, Prokop'yev, Chernyshev, Pavlova). 7. Leningradskiy gornyy institut (Tolstikhin). 8. Gosudarstvennyy nauchno-issledovatel'skiy institut kurortologii i fizioterapii (for Ivanov, Yarotskiy, Karaseva, Arutyunyants, Romanova). 9. Irkutskoye geologicheskoye upravleniye (for Trofimuk). 10. Baykal'skaya limnologicheskaya stantsiya Vostochno-Sibirskogo filiala AN SSSR (for Ladeyshchikov). 11. Otdel ekonomiki i geografii Vostochno-Sibirskogo filiala AN SSSR (for Kruchinina).

(Siberia, Eastern--Mineral waters)

L 1842-66 EWT(m)/EPF(c)/EWP(t)/EWP(b)/EWA(h) IJP(c) JD

ACCESSION NR: AT5022291 UR/3136/65/000/834/0001/0011

36 B+1

AUTHOR: Arifkhanov, U. R.; Vlasov, N. A.; Davydov, V. V.; Samoylov, L. N.

TITLE: Polarization in n-alpha at E sub n = 25, 28, and 34 MEV

SOURCE: Moscow. Institut atomnoy energii. Doklady, IAE-834, 1965. Polarizatsiya v n-alpha rasseyanii pri E_n=25, 28 i 34 Mev, 1-11

TOPIC TAGS: neutron polarization, neutron scattering, helium, proton, nuclear reaction

ABSTRACT: Polarization neutrons with energies of 25, 28, and 34 MEV were obtained in the reaction $T(d,n)He^4$ at an angle of 30°. Measurements of the asymmetry of scattering of these neutrons by helium were made at various angles ranging from 45 to 150°. The results obtained are compared with the angular dependence of the polarization in p-α scattering, interpolated to the same proton energies on the basis of data for other energies (22, 29, and 40 MEV). A satisfactory agreement is found between the angular dependence of the asymmetry of n-α and p-α scattering. On the basis of the agreement with polarization in p-α scattering, a preliminary evaluation of polarization in n-α scattering is given. Orig. art. has: 2 figures and 1 table.

Card 1/2

L 1842-66

ACCESSION NR: AT5022291

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: NP

NO REF SOV: 003 OTHER: 010

Card 2/2 dg

L 2738-66 EWT(m)/T/EWA(m)-2
ACCESSION NR: AP5024334 44,55 UR/0367/65/002/002/0239/0242

AUTHOR: Arifkhanov, U. R.; Vlasov, N. A.; Davydov, V. V.; Samoylov, L. N. 44,55 44,55 44,55 28 B

TITLE: Polarization in nα-scattering at neutron energies of 25, 28 and 34 Mev 19,44,55

SOURCE: Yadernaya fizika, v. 2, no. 2, 1965, 239-242

TOPIC TAGS: neutron scattering, nuclear scattering, alpha particle, proton scattering, neutron polarization, proton polarization

ABSTRACT: The asymmetry of nα-scattering for 45 to 150° is measured for the case of neutrons with energies of 25 ± 1.25, 27.8 ± 0.9 and 34 ± 0.75 Mev. The neutrons were produced in the T (d, n) He^4 reaction at an angle of 30° with deutron energies of 9.1 ± 1.3, 12.0 ± 1.0 and 19.0 ± 0.8 Mev. The results are compared with the angular relationship of polarization in pα-scattering, interpolated to the same proton energies from the available data for other energies (21.9, 28.8 and 40 Mev). Satisfactory agreement is found between the angular relationships of asymmetry in nα- and pα-scattering, and both relationships show identical divergence from the predictions of phase analysis extrapolated from the energy region below 20 Mev. The polarization in nα-scattering is roughly estimated on the basis of agreement

Card 1/2

L 2738-66

ACCESSION NR: AP5024334

with the polarization in pα-scattering. These polarization values must be verified by direct measurement. Orig. art. has: 2 figures, 1 table.

ASSOCIATION: none

SUBMITTED: 23Mar65 ENCL: 00 SUB CODE: NP

NO REF SOV: 004 OTHER: 010

Card 2/2

VLASOV, N.A.

Optical method for the detection of antimatter in the universe.
Astron.zhur. 41 no.5:893-897 S-O '64.

ALEKSEYEV, N.V.; ARIFKHANOV, U.R.; VLASOV, N.A.; DAVYDOV, V.V.; SAMOYLOV, L.N.

Polarization of neutrons in the T(d, n)He^4 reaction. Zhur. eksp. i teor. fiz. 47 no.2:434-438 Ag '64. (MIRA 17:10)

ALEKSEYEV, N.V.; ARIFKHANOV, U.R.; VLASOV, N.A.; DAVYDOV, V.V.;
SAMOYLOV, L.N.

Sources of polarized fast neutrons. Usp. fiz. nauk 83
no.4:741-752 Ag '64. (MIRA 17:9)

SAVVA, David Abramovich; VLASOV, Nikolay Dmitriyevich; BEL'SKIY, B.R., spets. red.; SHELYUTTO, Ye.P., red.; ZAYTSEVA, L.A., tekhn. red.

[Using the production-line method for watch and clock repairs] Remont chasov potochno-operatsionnym metodom. Moskva, Gos.izd-vo mestnoi promyshl. i khudozh.promyslov, RSFSR, 1961. 133 p. (MIRA 14:12)

(Clocks and watches--Repairing and adjusting)
(Assembly-line methods)

Vlasov, N.D.

VLASOV, Nikolay Dmitriyevich; SHLEPINA, M.M., redaktor; RAKOV, S.I., tekhnicheskiy redaktor;

[In the ranks of high-speed workers] V riady skorostnikov. [Moskva] Izd-vo VTsSPS Profizdat, 1954. 32 p. (MIRA 8:7)

1. Sverlovshchik Kolomenskogo ordena Lenina i ordena Trudovogo Krasnogo Znameni parovozostroitel'nogo zavoda imeni Kuybysheva (for Vlasov).
(Vlasov, Nikolai Dmitrievich)

BARKHATOV, B.; VLASOV, N.G.; ZAKHAROV, S.A.; KUKHTIKOV, M.M.

[Excursion guide of the second All-Union Tectonics Society] Putevoditel' ekskursii. Dushanbe, In-t geologii AN Tadzhik.SSR, 1962. 98 p. (MIRA 17:7)

1. Vsesoyuznoye tektonicheskoye soveshchaniye, 2d, Dushanbe.

VLASOV, N.G.

Tectonic position of the northern Pamirs. Vest. LGU 17 no.12: 126-130 '62. (MIRA 15:7)

(Pamirs--Geology, Structural)

VLASOV, N.G.; LIKHAREV, B.K.; MIKLUKHO-MAKLAY, A.D.

Cross-sectional faunistic description of the lower Permian deposits of the southwestern part of the Darvaza Range. Dokl. AN SSSR 144 no.5:1105-1108 Je '62. (MIRA 15:6)

1. Leningradskiy gosudarstvennyy universitet imeni Zhdanova i Vsesoyuznyy nauchno-issledovatel'skiy geologicheskiy institut.
(Darvaza Range--Paleontology, Stratigraphic)

VLASOV, N.G.

Tectonic pattern of the southwestern part of the Darvaza Range. Dokl.AN SSSR 145 no.6:1344-1347 Ag '62. (MIRA 15:8)

1. Leningradskiy gosudarstvennyy universitet im. A.A.Zhdanova. Predstavleno akademikom D.V.Nalivkinym.
(Darvaza Range—Geology, Structural)

VLASOV, Naum Il'ich; SAUTIN, Ivan Alekseyevich; ZYBIN, V.G., inzh., retsenzent; RUBANCHIK, Ya.A., ekonomist, red.; TKACHUN, A.I., red.izd-va; UVAROVA, A.F., tekhn.red.; MODEL', B.I., tekhn.red.

[Organization and planning of material and technical supply and marketing of machinery plants] Organizatsiia i planirovanie material'no-tekhnicheskogo snabzheniia i sbyta mashinostroitel'nykh predpriiatii. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1959. 310 p. (MIRA 13:2)
(Machinery industry) (Industrial management)

PANFILOV, Konstantin Konstantinovich, kand. tekhn. nauk; VLASOV, N.I., inzh., otv. red.; VYADRO, Sh.Ya., red.; MATVIICHUK, A.A., tekhn. red.

[Automation and remote control on railroads] Avtomatika i telemekhanika na zheleznykh dorogakh. Kiev, 1961. 46 p. (Obshchestvo po rasprostraneniiu politicheskikh i nauchnykh znanii Ukrainskoi SSR. Ser.7, no.10) (MIRA 15:1)

(Railroads) (Automation) (Remote control)

VLASOV, N. I.;

VLASOV, N.I.; ZIL'BERMAN, A.A.; POVERENNYY, I.D.; SAMOFAL, S.V., redaktor; VISHNEVSKIY, I.F., redaktor; ANDREYEV, S.P., tekhnicheskiy redaktor

[High-speed major repair work on blast furnaces] Skorostnoi kapital'nyi remont domennoi pechi. Khar'kov, Gos. nauchno-tekhn. izd-vo litry po chernoi i tsvetnoi metallurgii. 1952. 99 p. [Microfilm] (MLRA 7:9)

(Blast furnaces--Maintenance and repair)

VLASOV, N. I.

Skorostnoi kapital'nyi remont domennoi pechi [High-speed major repair work on blast furnaces. Moskva, Matallurgizdat, 1952. 100 p.

SO: Monthly List of Russian Accessions, Vol. 6 No. 8 November 1953

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

Apparatus for testing dry batteries. N. K. Vlasov. Russ. 25,647, Mar. 31, 1932.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

Salt bath for metals. A. P. Toropanov and N. S. Vlasov. **U.S.S.R. 67,222,** Oct. 31, 1940. In heat-treating metals in fused Na_2CO_3 and NaCl, surface oxidation and decarburization are prevented by addn. of SiC to the bath. An effective compn. for a salt bath is: NaCl 25, Na_2CO_3 70, and SiC 5%. M. Hosch

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

VLASOV, N.I.; KOLESNIKOV, V.V., inzh.

Making cards for assembly work on electronic digital computers. Transp. stroi. 13 no.7:58-60 Jl '63. (MIRA 16:9)

1. Glavnyy spetsialist Kiyevgiprotransa (for Vlasov). 2. Institut kibernetiki AN UkrSSR (for Kolesnikov).

(Electronic digital computers--Programming)

DEL RIO, B., kand.tekhn.nauk; VLASOV, N.I.

Some problems concerning the automation of train traffic control. Avtom., telem. i sviaz' 5 no.5:14-15 My '61. (MIRA 14:6)

1. Glavnyy spetsialist Kiyevgiprotransa (for Vlasov)
(Railroads—Signaling)

VLASOV, N.I.; SAUTIN, I.A.; IVANOV, N.V., kand.ekon.nauk, dotsent

Review of "Organization and planning of supply procurement and product marketing in machiner plants." Vest.mash. 40 no.6:84-85 Je '60. (MIRA 13:8)

(Machinery industry)

VLASOV, N.I., inzh.

Using "cold" concrete. Biul. stroi. tekh. 12 no.4:7-9 Ap '55. (MIRA 11:12)

1. Trest Uralkhimpromstroy. (Concrete--Cold weather conditions)